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ABSTRACT

This guide suggests ways to study the environment in the classroom. It provides information for setting up a classroom learning center including learning outcomes, activity suggestions, and resources and equipment for the learning center. Guidelines for a recycling program, a bird-feeding program, and terrarium-making are given. A bibliography of instructional materials, magazines, and conservation organizations provides the teacher with addresses and cost information. (MA)

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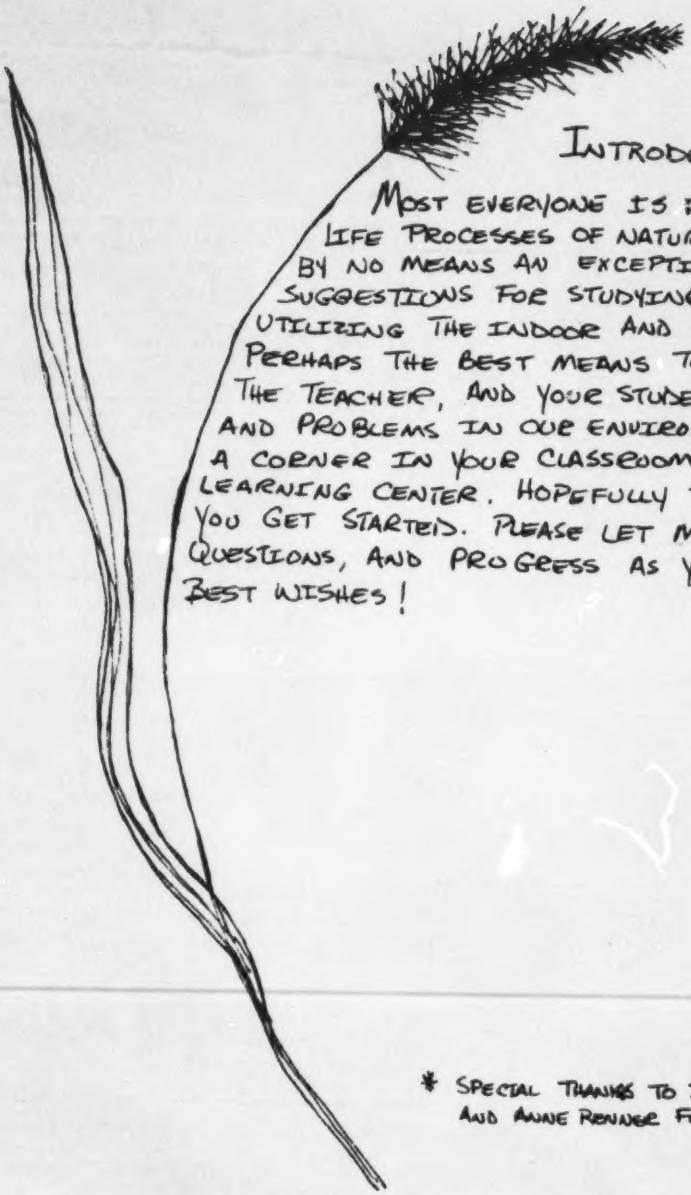
Bringing the Great Outdoors to Your Classroom

DIVISION OF PROGRAM DEVELOPMENT
BUREAU OF INSTRUCTION
KENTUCKY DEPARTMENT OF EDUCATION

SE 027 786



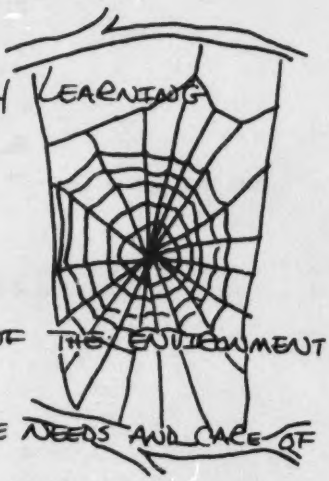
Introduction

Most everyone is fascinated with the life processes of nature and students are by no means an exception. This guide offers suggestions for studying our environment utilizing the indoor and outdoor classroom. Perhaps the best means to introduce yourself, the teacher, and your students to the wonders and problems in our environment is to set aside a corner in your classroom for an environmental learning center. Hopefully this publication can help you get started. Please let me know your suggestions, questions, and progress as you attempt this endeavor. Best wishes!

Nancy Stearns Theiss
Environmental Education
Consultant
Division of Program
Development
Kentucky Department
of Education

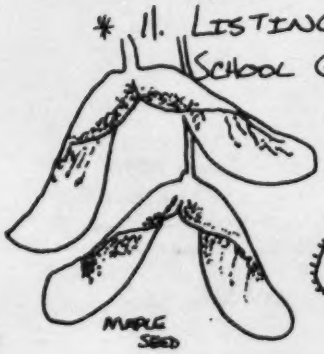
* Special thanks to Johanna Aquischell for suggestions and Annie Renner for help with illustrations

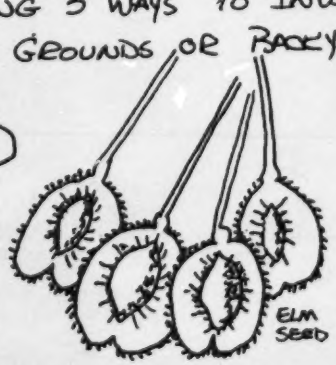
Environmental and Energy Learning Center



Possible Learning Outcomes:

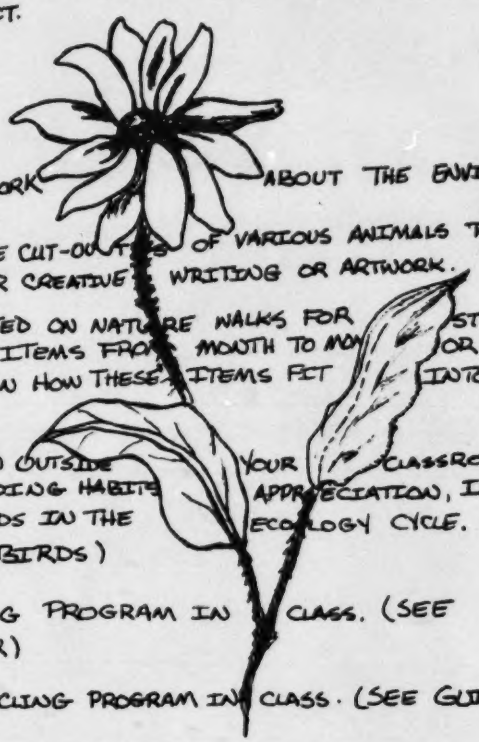
* 1. Identifying the components of the environment and the ecological cycles.
* 2. Learning facts concerning the needs and care of plants and animals.
* 3. Becoming familiar with books, periodicals, organizations, and magazines on wildlife, energy, environmental crisis, etc.
* 4. Drawing conclusions on ways to benefit and improve environmental conditions.
* 5. Think creatively by writing poems, stories, and plays on society's need for environmental improvements.
* 6. Matching flora and fauna to its particular habitat.
* 7. Naming at least 4 new ways to conserve energy at home and practicing at least 4 new ways to conserve energy at home.
* 8. Recognizing new words about the environment and energy.
* 9. Creating positive attitudes toward self and respect for one's surroundings.
* 10. Naming 4 animals and/or plants endangered in Kentucky.
* 11. Listing 3 ways to invite wildlife to visit school grounds or backyard at home.





* 12. PRACTICING AT LEAST 3 NEW WAYS IN WHICH TO ENCOURAGE WILDLIFE ON SCHOOL GROUNDS OR BACKYARD.
* 13. BECOMING FAMILIAR WITH WAYS IN WHICH ONE IS PART OF THE ECOLOGY CYCLE.
* 14. BECOMING FAMILIAR WITH WAYS TO RECYCLE MAN-MADE PRODUCTS AND PRACTICE ONE WAY TO RECYCLE A MAN-MADE PRODUCT.

POSSIBLE ACTIVITIES AT THE LEARNING CENTER



* 1. COMPOSE STORIES, POEMS, AND ART WORK ABOUT THE ENVIRONMENT FOR A CLASSROOM ECOLOGY NOTEBOOK.
* 2. MAKE A COLLECTION FROM MAGAZINE CUT-OUTS OF VARIOUS ANIMALS TO CLASSIFY, IDENTIFY, OR USE AS INSPIRATION FOR CREATIVE WRITING OR ARTWORK.
* 3. ESTABLISH A SHELF OF ITEMS COLLECTED ON NATURE WALKS FOR STUDENTS TO IDENTIFY AND EXPLORE. CHANGE ITEMS FROM MONTH TO MONTH OR SEASON TO SEASON. HOLD CLASS DISCUSSION ON HOW THESE ITEMS FIT INTO THE ECOLOGY CYCLE.
* 4. ESTABLISH A BIRD FEEDING STATION OUTSIDE YOUR CLASSROOM WINDOW TO OBSERVE BEHAVIOR, FEEDING HABITS, APPRECIATION, IDENTIFICATION AND IMPORTANCE OF BIRDS IN THE ECOLOGY CYCLE. (SEE GUIDELINES FOR FEEDING BIRDS)
* 5. PARTICIPATE IN A PAPER RECYCLING PROGRAM IN CLASS. (SEE GUIDELINES FOR RECYCLING PAPER)
* 6. CONTRIBUTE CANS TO THE CAN RECYCLING PROGRAM IN CLASS. (SEE GUIDELINES FOR RECYCLING CANS)
* 7. IDENTIFY PLANT COLLECTED ON NATURE WALKS. (DO NOT PICK ENDANGERED PLANTS AND ONLY PICK PLANTS WHICH ARE COMMON)
* 8. WORK PUZZLES ON ENVIRONMENTAL TOPICS.
* 9. CONSTRUCT A TERRARIUM TO ILLUSTRATE VARIOUS CYCLES. (SEE GUIDELINES FOR CONSTRUCTION OF A TERRARIUM)
* 10. READ CURRENT NEWSPAPER ARTICLES ON ENVIRONMENTAL TOPICS FOR CLASS DISCUSSION.
* 11. GROW PLANTS FROM HOUSEHOLD VEGETABLES SUCH AS CARROTS, BEETS, AVOCADO SEEDS, PINEAPPLE TOPS AND SWEET POTATOES.

CARROTS AND BEETS
REMOVE LEAVES AND TRIM 1" OF STEM AND 1" OF VEGETABLE. PLANT VEGETABLE END IN SOIL. WATER AND KEEP SOIL MOIST.

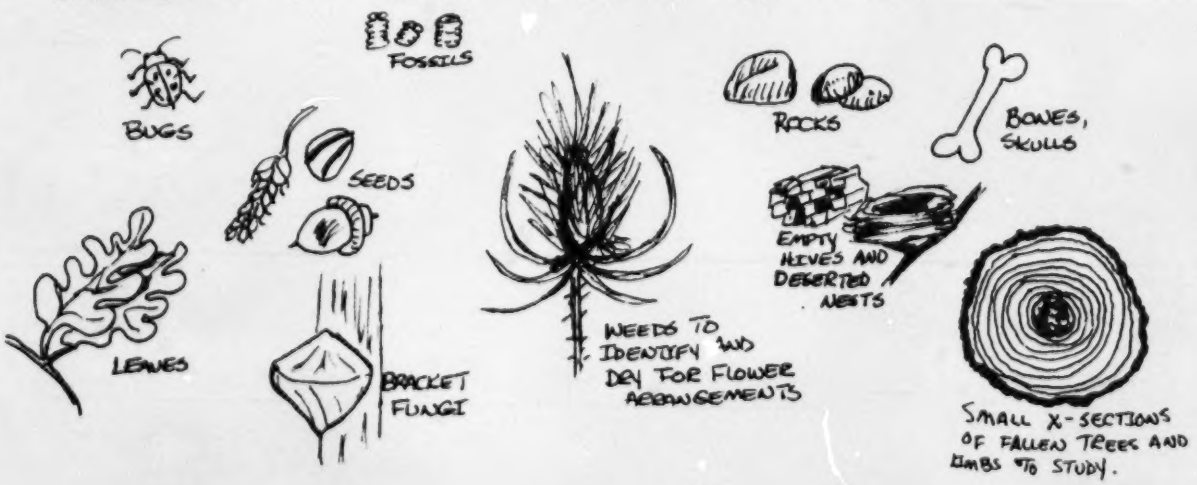
AVOCADO
REMOVE SEED FROM PLANT. STICK 3 TOOTH PICKS AROUND CENTER OF SEED. ROOT IN WATER THEN PLANT IN SOIL.

Possible Activities At The Learning Center (continued)

* 12. Look at books, magazines, and filmstrips on environmental issues.
* 13. Construct display charts on ways to conserve energy.
* 14. Construct display charts on endangered animals, ecology cycle, types of energy, etc.
* 15. Do activities listed on the environmental/energy task cards.
* 16. Plant and care for seeds collected on nature walks.
* 17. Read and complete activities in the environmental learning package.
* 18. Write conservation organizations for information on their purpose and accomplishments in the environmental field. (See list of conservation organizations)
* 19. Record and chart information on seed and plant requirements for growth.
* 20. Plan to develop a classroom garden plot for the class on school grounds. Start seeds in window gardens. Contact your local county extension agent and local 4-H club for information and help.
* 21. Classify and collect rocks ~~taken~~ from field trips, nature walks, etc.

Activities are limitless!! Refer to the bibliography list on current environmental/energy activities for the classroom.

Examples of some things to collect from nature walks:



A List of Possible Resources and Equipment for The Learning Center

*1. Magazines, newspapers, library books, periodicals, library filmstrips and projector.

*2. Posters (student or commercial) on ways to conserve energy.

*3. Collection of various puzzles and games on the environment, energy, etc.

*4. Construction paper, glue, string, crayons, markers, pencils, scissors, etc.

*5. Task cards on the environment, energy, etc.

*6. Materials to make terrariums and/or aquariums.

*7. Materials for a bird feeding station.

*8. Large, lined box to hold aluminum cans.

*9. Pots, digging tools, soil, jars, cans, etc.

*10. Area set aside to hold nature mystery items, rocks, etc.

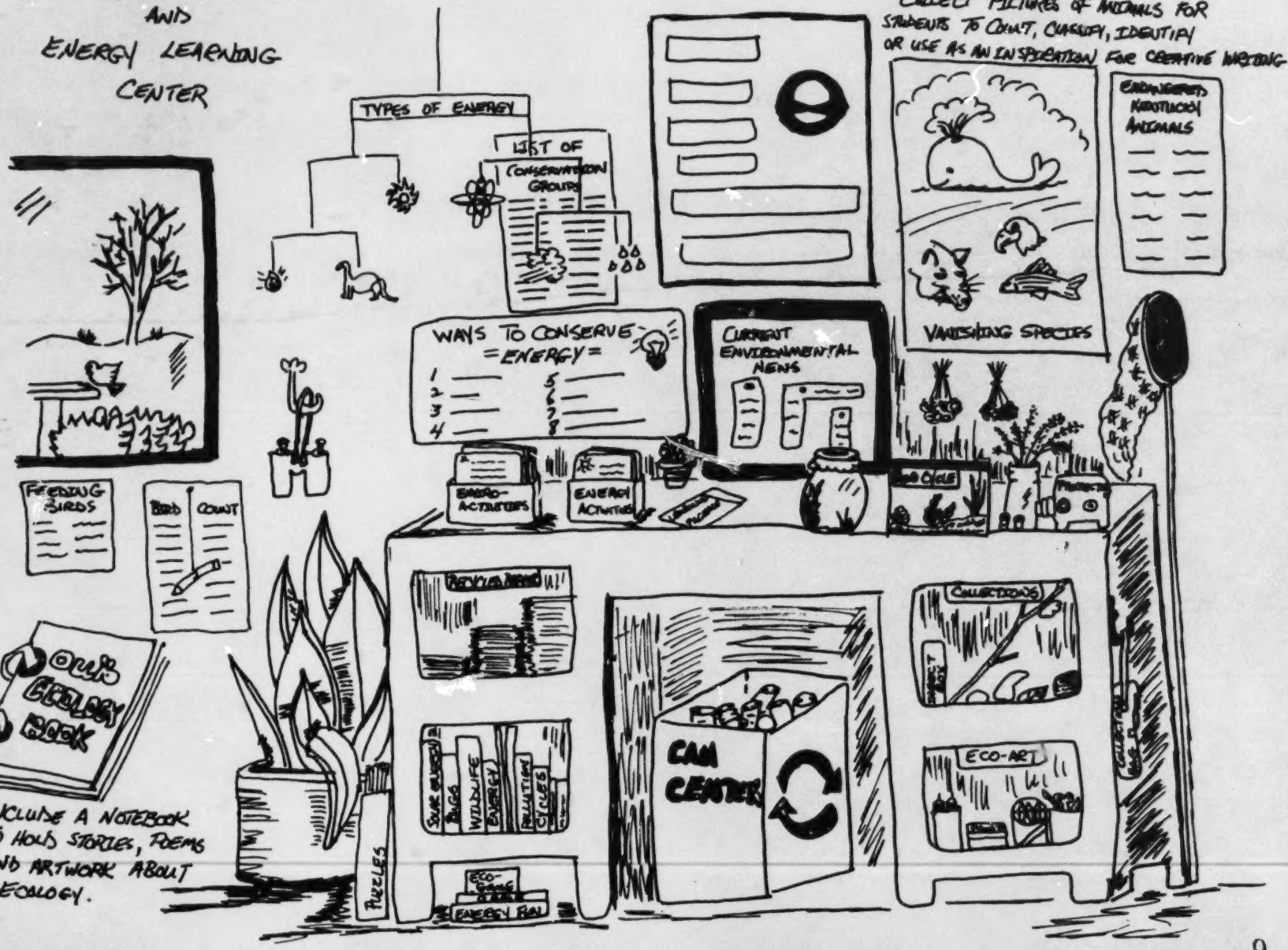
*11. Large chart on endangered Kentucky animals.

*12. Large chart on conservation organizations.

*13. Small bulletin board or area on wall to hold newspaper articles.

*14. Large table with drawers if possible, if no drawers are available then construct shelves from board and bricks, stack boxes, or tack ice cream cartons together.

ENVIRONMENTAL AND ENERGY LEARNING CENTER



COLLECT PICTURES OF ANIMALS FOR STUDENTS TO COUNT, CLASSIFY, IDENTIFY OR USE AS AN INSPIRATION FOR CREATIVE WRITING

INCLUDE A NOTEBOOK TO HOLD STORIES, POEMS AND ARTWORK ABOUT ECOLOGY.

Guidelines For A Recycled Paper Program At Your Center

Establish a recycled paper section in your center which encourages students not to throw away paper used only on one side. Use the paper for notes, artwork, etc. Remember that you as a teacher are an important example in this type of activity!

* Write To: American Paper Institute, Inc.
260 Madison Avenue
New York, N.Y. 10016
(212) 883-8000

Ask for their free pamphlet: How You Can Make Paper

* Refer To: "Mrs. Newspaper Story" in Energy Conservation Activities For The Classroom K-12 in your library.

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Guidelines For A Can Recycling Program At Your Center

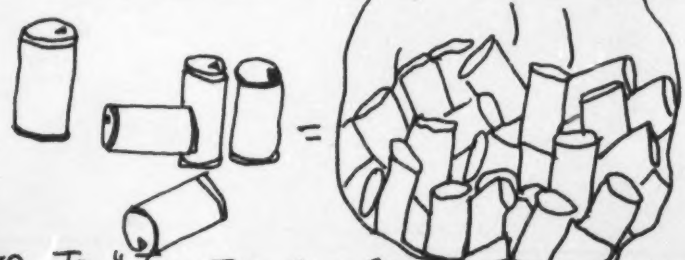
If you're lucky you might have an aluminum can recycling center close to your school. Obtain a large cardboard box to collect cans your students donate. This project can create extra spending money for your class (it could help pay for bird seed for your feeder). The following are some helpful hints:

A. Use a magnet to determine if cans students collect are aluminum or metal. Recycling centers do not accept metal cans. (If a magnet sticks to the can it is metal) Metal cans have seams along their sides, aluminum cans usually do not.

B. Be sure students completely empty cans before throwing them in the box. (Otherwise the classroom will smell like stale beer and cola and attract insects.)

C. If possible line your box. Many recycling centers will provide liners free-of-charge.

In past experience my students earned $10.00 to $12.00 a week for various class projects. To speed-up profit I held a contest between classes/with a picnic as a reward to the winning class. Be sure check however, if proceeding with this endeavor to look for cans loaded with rocks and cans for added weight!!



*Refer to "Jan The Can Story" in Energy Conservation Activities For The Classroom in your library.

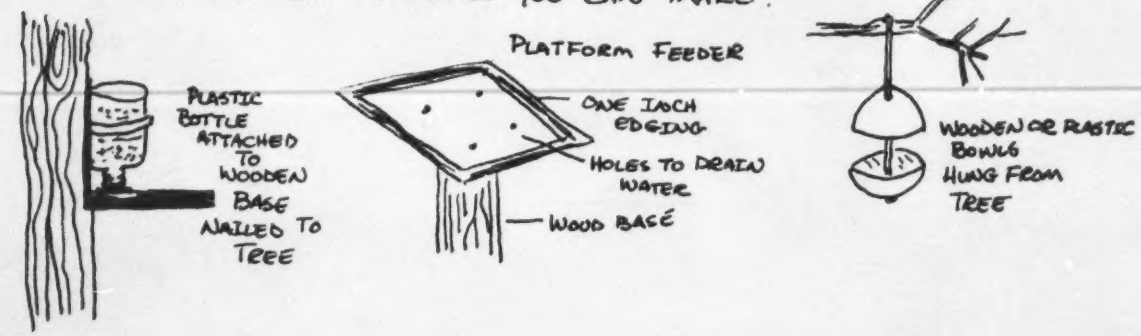
Guidelines For Feeding Birds At Your Center

The best time to begin feeding birds at your center is late October or early November. Please understand that unless you intend to supply food daily without interruption, you and your students should not begin this project. Birds become dependent on this source of food you provide and interruption of this program during the winter could result in hardship and death of birds which rely upon your supply of food.

Types of Food: Cracked corn mixed with sunflower seed attracts a variety of birds. A 50 pound bag of corn mixed with a 50 pound bag of sunflower seed proves the most economical. This supply lasts about 3 to 4 weeks for one average size feeder and can be purchased through local feed stores.

Common birds in Kentucky your feeder might attract: cardinal, blue jay, tufted titmouse, junco, various species of sparrows and woodpeckers, nuthatch, goldfinch, various blackbirds, and chickadees.

Some examples of feeders you can make:


Plastic bottle attached to wooden base nailed to tree
Platform Feeder
One inch edging
Holes to drain water
Wood base
Wooden or plastic bowl hung from tree

* Write: The Massachusetts Audubon Society and ask for their phamphlet Going To Seed Address listed under Conservation Organizations.

Guidelines For Making A Terrarium

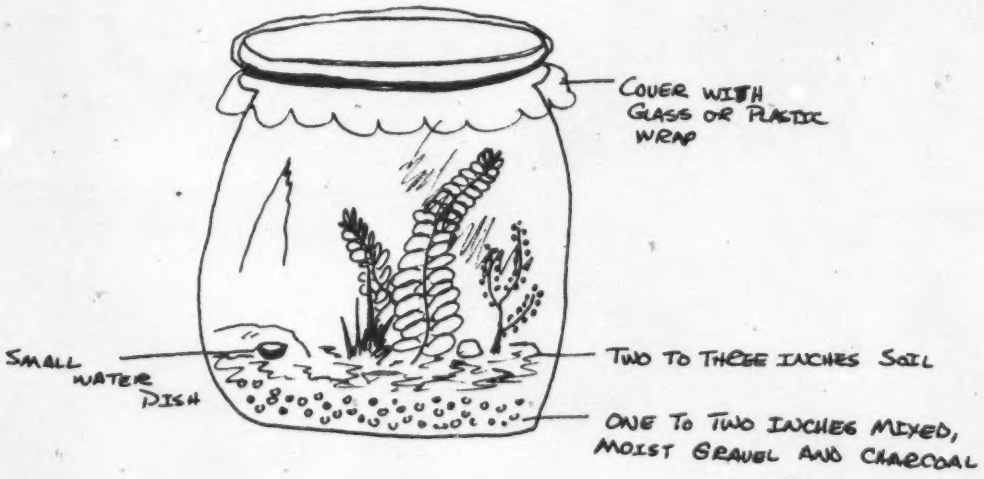
Terrariums can be constructed inexpensively and provide a valuable tool for teaching plant and animal interaction, the water cycle, and various habitat types. You might want to establish one large terrarium for the center or have students make their individual terrariums to study. The materials needed are:

Clear, clean glass container (wide-mouth gallon jar, drink glasses, baby food jar, etc.)

Gravel Charcoal
Soil Plants

Small water dish

Small animals
(snails, bugs, worms, small frog)
Make sure the container is large enough to accomodate the animal comfortably)

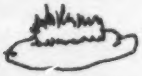

Cover with glass or plastic wrap
Small water dish
Two to three inches soil
One to two inches mixed, moist gravel and charcoal

Immediately after planting, water the soil just enough where water seeps through the bottom layer of the gravel/charcoal mixture. Cover the container with glass or plastic wrap. A series of fine water beads on the inside walls indicates the right amount of moisture. Never set your terrarium in direct sunlight (unless it contains desert plants).

Example of Local Items to Include in the Terrarium:

Insects

Lichens

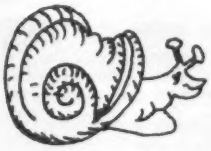


Violets

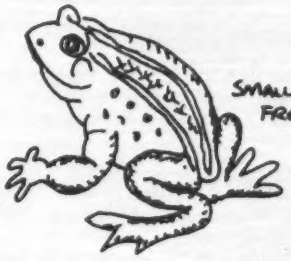
Earth Worms

Weathered Rock

Dandelions



Snails



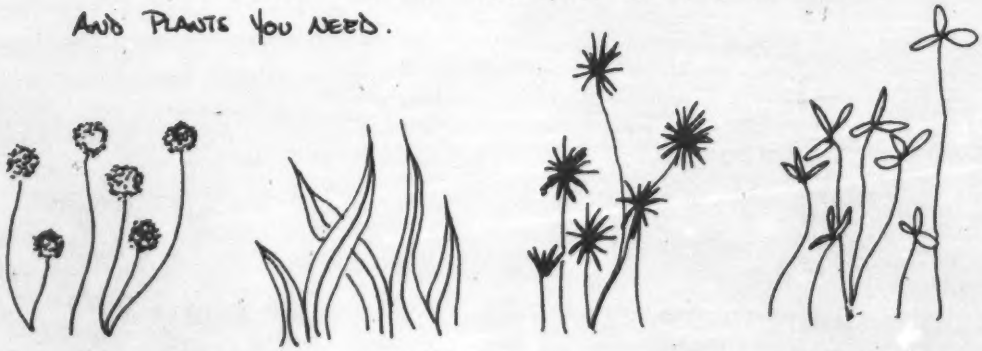
Small Frog

Pine Cones

Deciduous Seedlings
(Maple, Oak, Tulip Poplar, etc.)

If you include animals in your terrarium make sure they are not crowded and are fed suitably.

*To create examples of different habitats check with your local florist on types of requirements and plants you need.



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BIBLIOGRAPHY MATERIALS

(All prices subject to change)

NAME	ADDRESS
EXAMINING YOUR ENVIRONMENT SERIES Twelve books were written in this series which centers around specific topics-Trees, The Dandelion, Pollution, etc. Contains many fascinating projects, activities, etc.	Winston Press 430 Oak Grove Minneapolis, Minn. 55403 (Each book about $6.00)
OBIS A set of 3 volumes which deals with a variety of outdoor activities for youngsters to enjoy.	OBIS Lawrence Hall of Science University of California Berkeley, CA 94720 ($28.50 for all 3 sets)
ACCLIMATIZATION ACCLIMATIZING Both by Steve Van Matre Two excellent books which contain activities and philosophy for outdoor school curriculum.	Acclimatization Experiences Institute Box 841 Lake Geneva, Wisconsin 53147 ($7.50 for both books)
ESSENCE CARDS I and II A collection of a multitude of environmental activities which covers all age levels and subjects.	Addison-Wesley Pub. Co. Innovative Division 2725 Sand Hill Road Menlo Park, CA 94025 (About $19.00 per set)
YOU ARE AN ENVIRONMENT - TEACHING/LEARNING ENVIRONMENTAL ATTITUDES by Noel McInnus An excellent book on a positive philosophy of education and ways to develop an understanding of ways to teach and learn environmentally.	The Center for Curriculum Design P.O. Box 350 Evanston, IL 60204 ($2.00)

Bibliography Materials

NAME	ADDRESS
CONSERVATION ACTIVITIES FOR CLASSROOM Energy Education Curriculum Guide (Should be alread available in your school library.) This guide was written by a select group of Kentucky Teachers and contains activities in energy for subject levels and grades.	Available by special requests only: Environmental Education Consultant 1817 Capital Plaza Tower Frankfort, Kentucky 40601
BAGGAGE TAGS & USING THE SCHOOL & COMMUNITY Both these books contain unique activities for developing school programs in environmental education.	Lib Roller Coordinator Environmental Education Head School 500 20th Avenue, N. Nashville, TN (Baggage Tags-.50¢) (Using School-$2.50)
ENVIRONMENTAL UNITS NWF developed 24 units which include specific activities built around a certain topic. Write and ask for a brochure.	NWF Education Services 1412 16th Street, NW Washington, D.C. (approximately $1.00 ea.)
KNOCK THE FOUR WALLS DOWN Inexpensive Environmental Teaching Units Over 60 units are available in various topics for K-10. Write for a listing. Units include organized lesson plans and activities.	P.A. Schiller and Associates P.O. Box 307 Chicago, IL 60690 (approximately $1.00 ea.)

NAME	ADDRESS
SCIENCE ACTIVITIES IN ENERGY A series of simple experiments developed by Oak Ridge Associated Universities with assistance from The Lawrence Hall of Science. Written for 4-6 grades but can be used in other areas.	American Museum of Atomic Energy, Oak Ridge Associated Universities P.O. Box 117 Oak Ridge, TN 37830 (Free upon request)
ELSA CLUB WILDLIFE KITS For classroom membership of $15.00 your class will receive involvement packets, newsletters and a wildlife kit which includes classroom projects, information on animals, etc. Write for more information!	Elsa Wild Animal Appeal P.O. Box 4572 North Hollywood, CA 91607 ($15.00 for class membership)

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THE "ENERGY ENVIRONMENT SIMULATOR" The Energy Environment Simulator is a program designed to increase public awareness of current world energy problems and possible solutions. The program consists of a short slide talk on energy problems, a demonstration, and then a chance to play the "Energy Game". A program is about 90 minutes but can be cut to 30 minutes. Audiences can range from ten to a thousand but ideal size is 30 to 50. Write for more information.	Dr. Perry Wigley Department of Geology Eastern Kentucky University Richmond, Kentucky 40475 Phone: (606) 622-3270 Cost: Free

MAGAZINES	ADDRESS
-Ranger Rick Nature magazine for children ages 6-12. Full of activities, pictures, stories, etc.	National Wildlife Federation 1412 16th Street, N.W. Washington, D.C. (12 issues @ $7.00)
-Current Energy & Ecology A scholastic magazine which caps current topics in energy and ecology.	Curriculum Innovations, Inc. 501 Lake Forest Avenue Highwood, IL 60040 ($3.75 per student (Minimum 15) Other prices upon request.
-Audubon An adult nature magazine which covers current environmental units in The United States. Excellent photographs and illustration.	National Audubon Society 950 3rd Avenue New York, NY 10322 (12 issues @ $18.00/year)
-Curious Naturalist A quarterly publication for children which contains seasonal nature activities.	Massachusetts Audubon Society Lincoln, MA 01733 ($4.00 per year)
-Energy & Education Bimonthly publication available free of charge to anyone interested in energy education.	Mary McGuire National Science Teachers Association 1742 Connecticut Avenue,NW Washington, D.C. 20009
-Adventure Notebook A magazine for 8th grade and up. Nice photographs, up-to-date articles on the national scale concerning wildlife protection.	National Wildlife Federation 1412 16th Street, N.W. Washington, D.C. 20036 (6issues @ $7.50 per year)
-International Wildlife A magazine for 8th grade and up. Covers topics in wildlife protection on the international level.	National Wildlife Federation 1412 16th Street, N.W. Washington, D.C. 20036 (6 issues @ $7.50 per year)

CONSERVATION ORGANIZATIONS

NAME	ADDRESS
*National Wildlife Federation	1412 16th Street, N.W. Washington, D.C. 20036
Defenders of Wildlife	1244 Nineteenth, N.W. Washington, D.C. 20036
*National Audubon Society	950 3rd Avenue New York, NY 10022
Greenpeace	2108 W. 4th Avenue Van Couver, B.C. Canada
Center for Envrionmental Education	2100 M. Street, N.W. Washington, D.C. 20037
Elsa Clubs of America & Elsa Wild Animal Appeal	P.O. Box 4572 North Hollywood, California 91607
*Massachusetts Audubon Society	Lincoln, MA 01773
Association of Interpretive Naturalists, Inc.	International Business Office 6700 Needwood Road Derwood, Maryland 20855
Kentucky Department of Natural Resources and Environmental Protection	Pine Hill Plaza Frankfort, Kentucky 40601
National Association of Environmental Education	P.O. Box 560931 Miami, Florida 33156
U.S. Environmental Protection Agency	Office of Public Awareness Washington, D.C. 20460
*National Assocation of Conservation Districts	701 E. Main P.O. Box 158 Harper, Kansas 67058
U.S. Department of Energy	Hannah Mayfield Department of Energy Technical Information Center Oak Ridge, TN 37830
Kentucky Department of Energy	Capital Plaza Tower 12th Floor Frankfort, Kentucky 40601

NAME	ADDRESS
Kentucky Assocation for Environmental Education	Center for Environmental Education Murray State University Murray, Kentucky 42231
*American Forest Institute	1619 Massachusetts Avenue, N.W. Washington, D.C. 20036
Kentucky Department of Fish and Wildlife Resources	Public Relations Department Frankfort, Kentucky 40601
*Population Reference Bureau, Inc.	1337 Conneticut Avenue, N.W. Washington, D.C. 20036
*U.S. Forest Service	Public Information Room 816 1720 Peachtree Road, N.W. Atlanta, Georgia 30309
*U.S. Department of the Interior	Fish & Wildlife Service Washington, D.C.

*Organizations which are asteriked have free educational materials upon teachers request. Samples include large color posters, puzzles, phamphlets, etc.

ENDANGERED/THREATENED OR RARE SPECIES OF PLANTS AND ANIMALS IN KENTUCKY

This list was compiled by: The Kentucky Department of Fish and Wildlife with the help of The Kentucky Academy of Science.

NOTE: This list is subject to change periodically--check with the local game warden or Fish and Wildlife Department.

A. MAMMALS

I. Kentucky species in The Federal Register of Endangered Mammals.

1. Indiana Bat - Myotis sodalis
2. Grey Bat - Myotis grisescens
3. Red Wolf - Canis rufus

II. Species rare or threatened in Kentucky but may be common elsewhere.

1. Common Shrew - Sorex cinereus
2. Bachman's Shres - Sorex longirostris
3. Southeastern Bat - Myotis austroriparius
4. Small Footed Myotis - Myotis leibii
5. Cloudland Deer Mouse - Peromyscus maniculatur nubiterrae
6. Cotton Rat - Sigmodon hispidus
7. Red-Backed Mouse - Clethrionomys gapperi
8. Woodland Jumping Mouse - Napaeozapus insignis
9. Meadow Jumping Mouse - Zapus hudsonius
10. Spotted Skunk - Spilogale putorius
11. River Otter - Lontra canadensis
12. Bobcat - Lynx rufus
13. Black Bear - Ursus americana
14. New England Cottontail - Sylvalagus transitionalis
15. Swamp Rabbit - Sylvalagus aquaticus

B. BIRDS

I. Species on The Federal Register of Endangered Birds

1. Artic peregrine falcon (Migrant)
2. Kirtland warbler (Migrant)
3. Red-Cockaded Woodpecker (Migrant)
4. Bald eagle (Winter resident)

II. Species rare or threatened in Kentucky but may be common elsewhere.

1. Golden Eagle
2. Osprey
3. Mississippi Kite
4. Sandhill Crane
5. Common Raven

C. AMPHIBIANS AND REPTILES

I. Species on The Federal Register of Endangered Amphibians and Reptiles:

NONE

II. Species rare or threatened in Kentucky may be common elsewhere.

1. Western Lesser Siren
2. Three-toed Salamander
3. Four-toed Salamander
4. Western Bird Voiced Tree Frog
5. Green Tree Frog
6. Mole Salamander
7. Red-backed Slaamander
8. Northern Crayfish Frog
9. Barking Tree Frog
10. Kirtland's Water Snake
11. Eastern Ribbon Snake
12. Western Mud Snake
13. Eastern Coachwhip Snake
14. Corn Snake
15. Western Ribbon Snake
16. Northern Pine Snake
17. Prairie King Snake
18. Northern Scarlet Snake
19. Southeastern Crowned Snake
20. Scarlet Kingsnake
21. Green Water Snake
22. Broad-Banded Water Snake
23. Red Milk Snake
24. Slender Glass Lizard
25. Northern Coal Skink
26. Alligator Snapping Turtle
27. False Map Turtle
28. Mississippi Map Turtle
29. Slider
30. Missouri Slider

D. INVERTEBRATE

I. Species on The Federal Register of Endangered Invertebrates:

1. Pearly Mussel
2. Rough Pig-Toed Mussel
3. Turbicled Blossum Pearly Mussel
4. Cumberland Bean Pearly Mussel

*For a list on rare, threatened or endangered plants of Kentucky, write:

Department of Fish and Wildlife
592 E. Main Street
Frankfort, Kentucky 40601